William Tell Air Cannons

The story of William Tell is about a father who uses a bow and arrow to shoot an apple off his son’s head.

###### **MATERIALS**

* 5 gallon bucket or a large trash can
* Rubber Bands
* Plastic shower curtain
* Styrofoam Cups

###### **EXPERIMENT**

1. Stretch a shower curtain across the top of the bucket. Believe it or not, a piece of clear plastic shower curtain works great. Just stretch a piece of the shower curtain over the top of the bucket and secure it in place using a rubber band or two.
2. Lightly hit the shower curtain with your hand. An invisible blast of air shoots out of the hole. Just aim the air cannon at someone or something across the room and send a blast of air their way with a whack of the membrane.
3. Set up a Styrofoam cup on a person’s head and aim to shoot it off.

###### **HOW DOES IT WORK?**

The proper name for the air cannon device is vortex generator. The "ball" of air that shoots out of the cannon is actually a flat vortex of air, similar to rings of smoke blown by a talented cigar smoker. A vortex is generated because the air exiting the bucket at the center of the hole is traveling faster than the air exiting around the edge of the hole. That swirling or vortex motion can be observed if a little smoke is blown into the bucket just before giving the rubber membrane a gentle push. This activity demonstrates that air occupies space... and the flying smoke rings are an added bonus.